

## AMENDED CLAIMS

**[received by the International Bureau on 05 July 2004 (05.07.04);  
original claims 3, 6, 7 and 16-43 amended; new claims 57-64 added;  
remaining claims unchanged (9 pages)]**

1           1.     A concrete mixing truck for transporting concrete from one  
2 location to another comprising:  
3                 a chassis including: a frame, a first power source coupled to the  
4 frame, wheels coupled to the frame, and a first drivetrain coupling the first  
5 power source and the wheels;  
6                 a second drivetrain coupled to a second power source; and  
7                 a mixing drum coupled to the frame and to the second drivetrain,  
8 the drum comprising:  
9                 a wall defining a first end of the drum and a second end of  
10 the drum;  
11                 a drive ring coupled to the first end of the drum and  
12 comprising:  
13                 a hub operatively coupled to the second drivetrain;  
14                 and  
15                 a plurality of extensions extending outwardly from  
16 the hub into the wall of the drum, at least one of the extensions  
17 including an aperture extending therethrough;  
18                 wherein rotation of the hub by the second drivetrain causes  
19 rotation of the drum.

1           2.     The concrete mixing truck of claim 1, wherein the first power  
2 source and the second power source are the same power source.

1           3.     The concrete mixing truck of claim 1, wherein the wall includes a  
2 first layer and a second layer exterior to the first layer.

1           4.     The concrete mixing truck of claim 3, wherein the extensions  
2 extend into the second layer of the wall.

1           5.     The concrete mixing truck of claim 4, wherein the first layer is  
2 made from an elastomeric material.

1           6.     The concrete mixing truck of claim 5, wherein the second layer is  
2     made from a reinforced composite material including fibers and resin.

1           7.     The concrete mixing truck of claim 6, wherein the aperture is  
2     configured to allow the resin used in the construction of the second layer of  
3     the wall to infiltrate the aperture.

1           8.     The concrete mixing truck of claim 7, wherein the fiber in the  
2     second layer extends between the extensions.

1           9.     The concrete mixing truck of claim 8, wherein the hub is  
2     substantially cylindrical.

1           10.    The concrete mixing truck of claim 9, wherein the extensions  
2     extend radially outward from the hub.

1           11.    The concrete mixing truck of claim 10, wherein the extensions are  
2     spaced apart around the hub.

1           12.    The concrete mixing truck of claim 1, wherein the extensions are  
2     triangular.

1           13.    The concrete mixing truck of claim 1, wherein the extensions are  
2     rectangular.

1           14.    The concrete mixing truck of claim 1, wherein the drive ring is  
2     integrally formed as a single unitary body.

1           15.    The concrete mixing truck of claim 14, wherein drive ring is  
2     formed from a cast material.

1           16.    A composite, heavy duty rotary concrete mixing drum for coupling  
2     to a vehicle having a drivetrain for rotating the drum, the drum comprising:  
3                a wall defining a first end of the drum and a second end of the  
4     drum;

5                   a drive ring coupled to the first end of the drum and comprising:  
6                   a hub configured to be operatively coupled to the drivetrain;  
7           and  
8                   a plurality of extensions extending outwardly from the hub  
9           into the wall of the drum, at least one of the extensions including an  
10          aperture;  
11                  wherein rotation of the hub by the drivetrain causes rotation of  
12   the drum.

1           17.   The concrete mixing drum of claim 16, wherein the wall includes  
2   a first layer and a second layer.

1           18.   The concrete mixing drum of claim 17, wherein the extensions  
2   extend into the second layer of the wall.

1           19.   The concrete mixing drum of claim 18, wherein the first layer is  
2   made from an elastomeric material.

1           20.   The concrete mixing drum of claim 19, wherein the second layer  
2   is made from a fiber reinforced composite material.

1           21.   The concrete mixing drum of claim 20, wherein the aperture is  
2   configured to allow resin used in the construction of the second layer of the  
3   drum to infiltrate the aperture.

1           22.   The concrete mixing drum of claim 21, wherein the fiber in the  
2   second layer extends between the extensions.

1           23.   The concrete mixing drum of claim 22, wherein the hub is  
2   substantially cylindrical.

1           24.   The concrete mixing drum of claim 23, wherein the extensions  
2   extend radially outward from the hub.

1           25.   The concrete mixing drum of claim 24, wherein the extensions are  
2 spaced apart around the hub.

1           26.   The concrete mixing drum of claim 16, wherein the extensions are  
2 triangular.

1           27.   The concrete mixing drum of claim 16, wherein the extensions are  
2 rectangular.

1           28.   The concrete mixing drum of claim 16, wherein the drive ring is  
2 formed from a cast material.

1           29.   The concrete mixing drum of claim 28, wherein the cast material  
2 is off-tempered ductile iron.

1           30.   A composite, heavy duty rotary concrete mixing drum for coupling  
2 to a vehicle having a drivetrain for rotating the drum, the drum comprising:  
3                   a wall defining a first end of the drum and a second end of the  
4 drum;  
5                   a drive ring integrally formed as a single unitary body from a cast  
6 material, wherein the drive ring is coupled to the first end of the drum and  
7 comprising:  
8                   a hub configured to be operatively coupled to the drivetrain;  
9           and  
10                  a plurality of extensions extending outwardly from the hub  
11 into the wall of the drum;  
12                  wherein rotation of the hub by the second drivetrain causes  
13 rotation of the drum.

1           31.   The concrete mixing drum of claim 30, wherein at least one of the  
2 extensions includes a aperture extending therethrough.

1           32.   The concrete mixing drum of claim 30, wherein the wall includes  
2 a first layer and a second layer.

1           33.    The concrete mixing drum of claim 32, wherein the extensions  
2   extend into the second layer of the wall.

1           34.    The concrete mixing drum of claim 33, wherein the first layer is  
2   made from an elastomeric material.

1           35.    The concrete mixing drum of claim 34, wherein the second layer  
2   is made from a fiber reinforced composite material.

1           36.    The concrete mixing drum of claim 35, wherein the aperture is  
2   configured to allow resin used in the construction of the second layer of the  
3   wall to infiltrate the aperture.

1           37.    The concrete mixing drum of claim 36, wherein the fiber in the  
2   second layer extends between the extensions.

1           38.    The concrete mixing drum of claim 37, wherein the hub is  
2   substantially cylindrical.

1           39.    The concrete mixing drum of claim 38, wherein the extensions  
2   extend radially outward from the hub.

1           40.    The concrete mixing drum of claim 39, wherein the extensions are  
2   spaced apart around the hub.

1           41.    The concrete mixing drum of claim 30, wherein the extensions are  
2   triangular.

1           42.    The concrete mixing drum of claim 30, wherein the extensions are  
2   rectangular.

1           43.    The concrete mixing drum of claim 30, wherein the cast material  
2   is off-tempered ductile iron.

1           **44.**    A drive ring for coupling to a heavy duty rotary concrete mixing  
2   drum capable of attachment to a vehicle having a drivetrain for rotating the  
3   drum, the drive ring comprising:

4                   a hub configured to be operatively coupled to the drivetrain of the  
5   vehicle; and

6                   a plurality of projections extending outwardly from the hub and  
7   configured to engage the drum, at least one of the projections including an  
8   aperture.

9           **45.**    The drive ring of claim 44, wherein the aperture is configured to  
10   allow resin used in the construction of the drum to infiltrate the aperture.

1           **46.**    The drive ring of claim 44, wherein the projections are configured  
2   to allow fiber used in the construction of the drum to extend between the  
3   projections.

1           **47.**    The drive ring of claim 44, wherein the hub is substantially  
2   cylindrical.

1           **48.**    The drive ring of claim 47, wherein the projections extend radially  
2   outward from the hub.

1           **49.**    The drive ring of claim 44, wherein the distance between each of  
2   the projections around the hub is less than 6 inches.

1           **50.**    The drive ring of claim 44, wherein the plurality of projections  
2   includes 12 projections.

1           **51.**    The drive ring of claim 48, wherein the projections are spaced  
2   apart around the periphery of the hub.

1           **52.**    The drive ring of claim 44, wherein the projections are triangular.

1           **53.**    The drive ring of claim 44, wherein the projections are  
2   rectangular.

1           **54.**   The drive ring of claim 44, wherein the drive ring is integrally  
2   formed as a single unitary body from a cast material.

1           **55.**   The drive ring of claim 54, wherein the cast material is off-  
2   tempered ductile iron.

1           **56.**   The drive ring of claim 44, wherein the extensions are configured  
2   to angle toward the mixing drum.

1           **57.**   A method of coupling a drive ring to a wall of a composite mixing  
2   drum, the wall comprising fibers and resin, the drive ring being configured to  
3   transfer a rotational force applied by a powered drivetrain to the wall, the  
4   method comprising the steps of:

5                   providing a drive ring including:

6                           a hub configured to be coupled to the powered drivetrain,

7                   and

8                           a plurality of extensions extending outwardly from the hub;

9                           forming the wall around the extensions; and

10                          mechanically interlocking the wall to the drive ring;

11                          so that when the drive ring is coupled to the powered drivetrain,  
12   the force applied by the powered drivetrain to the drive ring will be distributed  
13   within the wall.

1           **58.**   The method of claim 57, wherein the step of forming the wall  
2   around the extensions comprises the step of wrapping the fibers of the wall  
3   around at least one of the extensions.

1           **59.**   The method of claim 57, wherein the extensions include apertures  
2   and wherein the step of mechanically interlocking the wall to the drive ring  
3   comprises the step of filling the apertures with the resin of the wall.

1           **60.**   The method of claim 57, wherein the extensions each include an  
2   aperture and wherein the step of mechanically interlocking the wall to the drive  
3   ring comprises the step of filling each aperture with the resin of the wall.

1           61.    The method of claim 57, wherein the hub and the extensions of  
2   the drive ring are formed as a single unitary body from a cast material.

1           62.    The method of claim 57, wherein the extensions each include an  
2   aperture and wherein the step of mechanically interlocking the wall to the drive  
3   ring comprises the step of forming a portion of the wall within the aperture.

1           63.    A concrete mixing drum for coupling to a power source for  
2   rotating the drum, the drum comprising:

3                   a wall defining a first end of the drum and a second end of the  
4   drum;

5                   a drive ring coupled to the first end of the drum and comprising:

6                           a hub configured to be operatively coupled to the power  
7   source; and

8                           a plurality of extensions extending outwardly from the hub  
9   into the wall of the drum, at least one of the extensions including an  
10   aperture;

11                   wherein rotation of the hub by the power source causes rotation  
12   of the drum.



1           64.    A concrete mixing drum for coupling to a power source for  
2 rotating the drum, the drum comprising:  
3                a wall;  
4                a drive ring coupled to the wall and comprising:  
5                    a hub configured to be operatively coupled to the power  
6 source; and  
7                a plurality of extensions extending outwardly from the hub  
8 into the wall,  
9                one of the wall and the plurality of extensions including a plurality  
10 of recesses, the other one of the wall and the plurality of extensions including  
11 a plurality of corresponding projections for engaging the plurality of recesses;  
12                wherein rotation of the hub by the power source causes rotation  
13 of the drum.